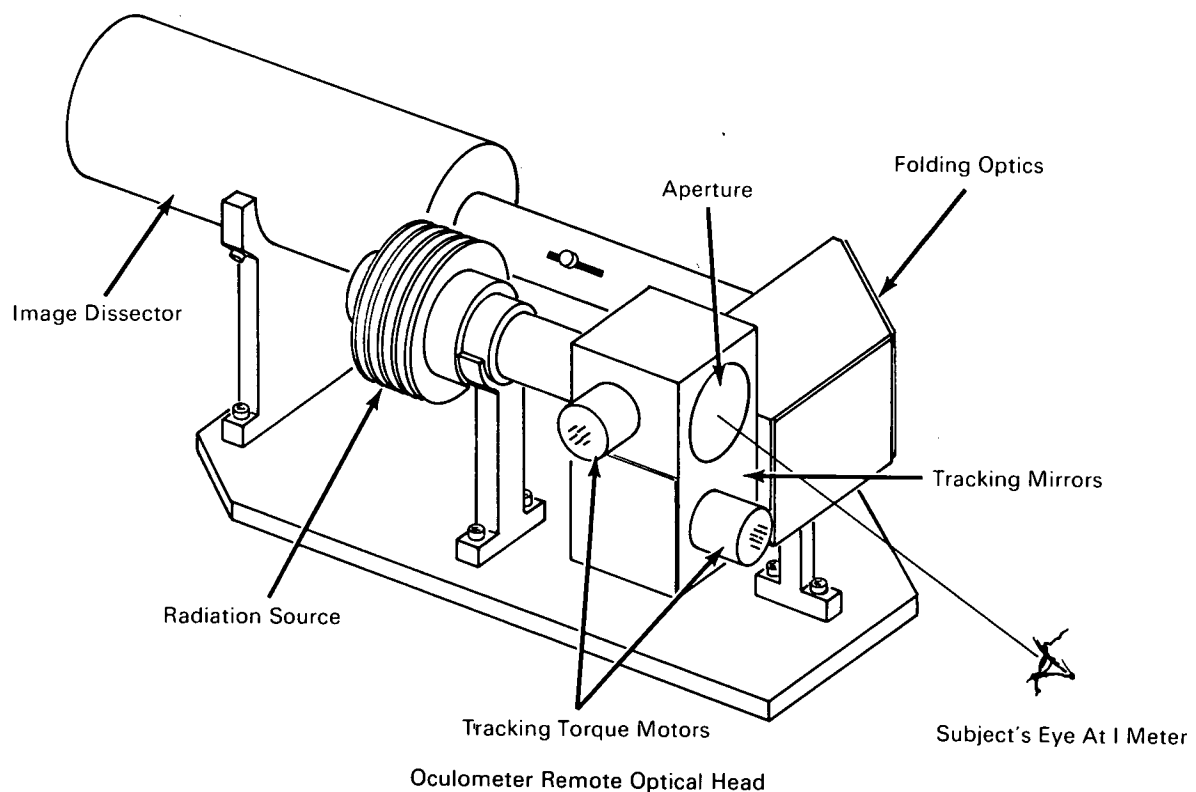


# NASA TECH BRIEF



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## Oculometer for Remote Tracking of Eye Movement



In many measurement and control situations it is often necessary to monitor or utilize eye movements. A prototype oculometer which tracks lateral eye position and measures the direction of the eye's optical axis, pupil size, and blink occurrence has been developed to perform measurements on the subject on a real-time basis from a remote location.

In operation, the subject's eye is irradiated by a collimated beam of near-infrared energy. The beam continuously tracks eye position by means of two

orthogonal axis servo-controlled mirrors. An electro-optic image dissector detects the near-infrared energy reflected from the eye's corneal and retinal surfaces. From measurements of the detected signals, which include the position of the corneal reflections relative to the centroid of the pupil-iris boundary, eye pointing directions and the other eye movements are electronically derived. The prototype instrument will accommodate lateral eye displacements of 12 cm at a range of one meter. Eye pointing directions can be

(continued overleaf)

derived with an accuracy of approximately  $0.2^\circ$  over a visual field extending nearly  $20^\circ$  both horizontally and vertically. The measurement of pupil size is substantially linear over the range of 2 to 9 mm.

**Note:**

Requests for further information may be directed to:  
Technology Utilization Officer  
Electronics Research Center  
575 Technology Square  
Cambridge, Massachusetts 02139  
Reference: B69-10444

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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